

Fire Building Sacramento National Wildlife Refuge

Final Environmental Assessment

September 2009

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Chapter 1. Purpose of and Need for Action

Introduction

This environmental assessment (EA) evaluates the environmental effects of three alternatives for the construction of a new fire building at the Sacramento National Wildlife Refuge (Refuge). The U.S. Fish and Wildlife Service (Service) will use this EA to solicit public involvement and to determine whether the implementation of the alternatives would have a significant effect on the quality of the human environment. This EA is part of the Service's decision-making process in accordance with the National Environmental Policy Act (NEPA), amended and its implementing regulations.

Purpose of and Need for the Proposed Action

The Service proposes to implement Alternative B, as described in this EA. The Service proposes to construct the fire building west of the bunkhouse on Sacramento Refuge. The proposed fire building will provide an office, fire cache, equipment storage, and fitness center for the North Central Valley Fire Management Zone fire program stationed at the Sacramento National Wildlife Refuge Complex (Complex).

Currently, the fire cache and fitness equipment is located in an equipment storage building built between 1937 and 1942, and the fire staff offices are located in an office building built in 1939. Both of these buildings are eligible for inclusion in the National Register of Historic Places (NRHP) and are treated as historic buildings. This limits the amount of repairs or modifications that can be made to these buildings to improve working conditions for the fire crew. In addition, these buildings do not meet seismic standards.

These facilities are inadequate for the staff needs and equipment is not able to be stored properly. The equipment storage building has no heating or cooling capabilities and has perpetual safety problems including a leaking roof, dry rot, and rodents. The office space is limited. Fire equipment is currently stored in multiple buildings or outside. All of the fire engines are parked outside exposing them to damage from the elements and rodents.

Project Area

The Refuge is part of the Sacramento Complex and is located in the Sacramento Valley of north-central California (Figure 1). The Valley is bordered on the east by the Sierra Nevada Range and on the west by the Coast Range. The Refuge, located in Glenn and Colusa counties, is situated about 90 miles north of the metropolitan area of Sacramento and six miles south of the town of Willows, population 6,000.

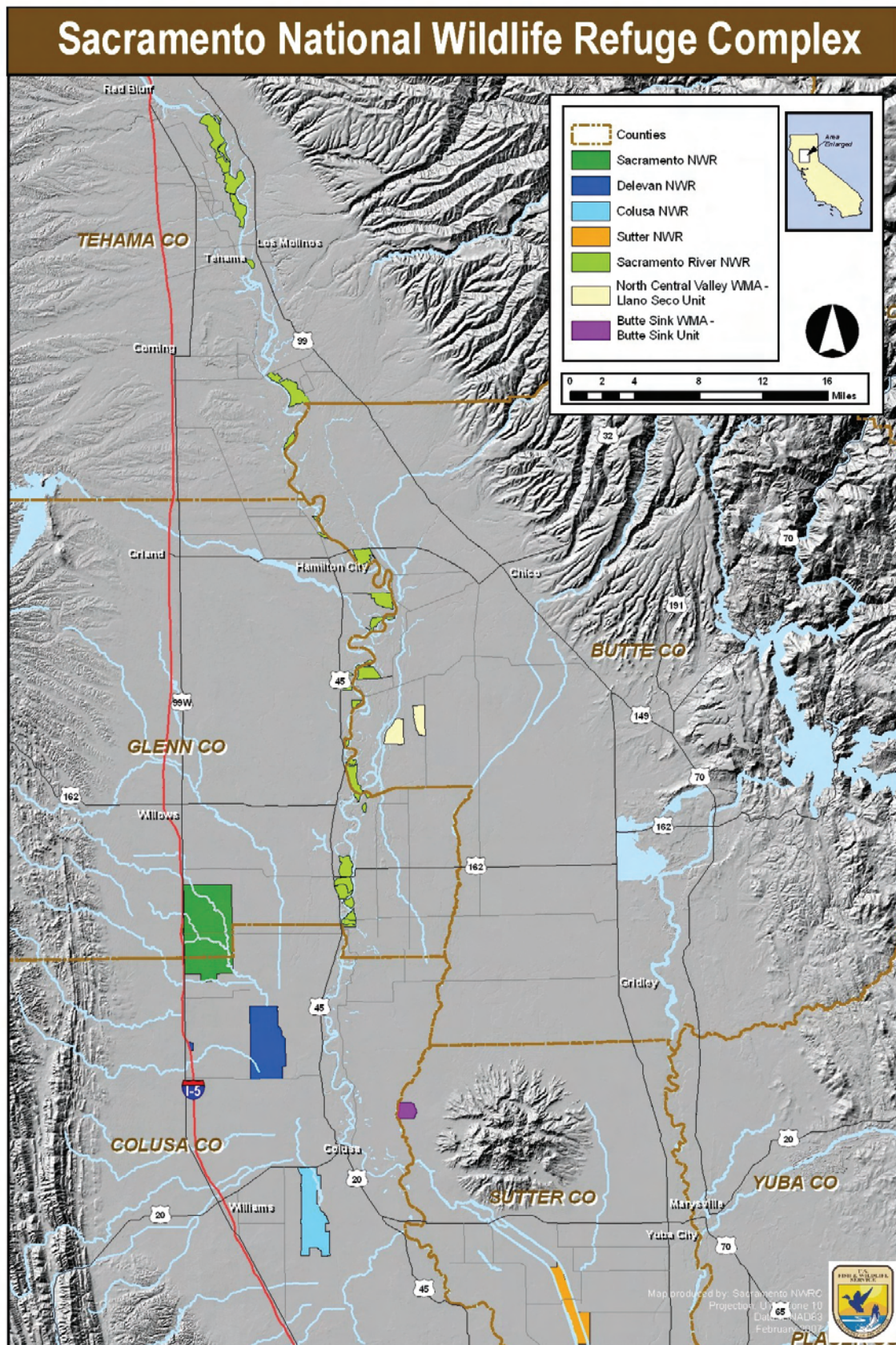
Sacramento Refuge was established in 1937 to provide refuge and breeding habitat for migratory birds and other wildlife, and it functions as the headquarters for the entire Complex. The Refuge is currently 10,819 acres (Figure 2) and is comprised of approximately 7,086 acres of managed wetlands (summer wetlands and seasonally flooded

wetlands); and 3,360 acres of unmanaged wetlands, grasslands, alkali meadows, vernal pools, and riparian habitats. The Refuge intensively manages these habitats to help support the abundance of waterfowl and other wetland-dependent wildlife.

The Refuge currently supports approximately 250 species of birds. By far, the most dramatic are the wintering concentrations (November to January) of 500,000 to 750,000 ducks and 200,000 geese. Historically, this is quite a change, as the area formerly supported many more geese than ducks, but the advent of rice culture in the early 1900s helped shift the balance. Raptor numbers swell as the waterfowl numbers increase, with their ranks including bald eagles and peregrine falcons. In addition, shorebird populations peak in the spring, while some waterfowl and numerous migratory songbird species nest here during the summer. The Refuge is also home to numerous rare, threatened or endangered species, of which eight (many associated with vernal pools) are federally listed. The alkali meadow and vernal pool habitats on the Refuge represent some of the largest remaining areas of this habitat type.

The visitor center is located in the Refuge headquarters office. Refuge staff is available to help plan a visit, answer questions and assist visitors. There are a number of opportunities to enjoy including a wildlife diorama, discovery room, and bookstore. Recreation activities on the Refuge include hunting, wildlife observation, photography, environmental education, and interpretation. A six-mile auto tour route with an interpretive radio broadcast and a two-mile walking trail are open year-round. A multi-level viewing platform on the auto tour gives a panoramic view of the Sacramento Valley and provides visitors with opportunities to observe wildlife from among the treetops. Two photography blinds are available by advance reservation. Hunting of waterfowl, coot, common moorhen, snipe, and pheasant is permitted on the southern portion of the Refuge on Saturdays, Sundays, and Wednesdays during the legal seasons. The hunt program is cooperatively managed with the California Department of Fish and Game and offers spaced blind, assigned pond, and free roam hunting opportunities via a permit system.

Figure 1. Sacramento National Wildlife Refuge Complex Map.



Decisions to be Made

Based on the analysis documented in this EA, the Regional Director must determine if the construction of a new fire building is in the best interest of the public and the Refuge. The Regional Director must also determine whether the proposed action would have a significant effect on the quality of the human environment.

Public Involvement

Interested individuals, organizations, and agencies had a 30-day comment period, July 31 through August 31, 2009, to review the draft EA. To facilitate public review this document was available electronically on the Complex's website

<http://sacramentovalleyrefuges.fws.gov> and a hardcopy at the Complex's main office in Willows, California. CD's will also be provided upon request.

As of September 3, 2009, we have not received any comments on the draft EA and a Finding of No Significant Impact (FONSI) has been prepared.

U.S. Fish and Wildlife Service and National Wildlife Refuge System

The mission of the Service is to conserve, protect, and enhance the nation's fish, wildlife, and their habitats for the continuing benefit of the American people. The Service is the primary Federal agency responsible for migratory birds, endangered plants and animals, certain marine mammals, and anadromous fish. This responsibility to conserve our nation's fish and wildlife resources is shared with other Federal agencies and State and Tribal governments.

As part of this responsibility, the Service manages the National Wildlife Refuge System (Refuge System). The Refuge System is the only nationwide system of Federal lands managed and protected for wildlife and their habitats. The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

The Sacramento Refuge is managed as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 as amended by the Improvement Act, and other relevant legislation, executive orders, regulations, and policies.

Refuge Purposes

The Refuge purposes are:

“... as a refuge and breeding ground for migratory birds and other wildlife...” Executive Order 7562, February. 27, 1937

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act of 1929)

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species.... or (B) plants ...” 16 U.S.C. § 1534 (Endangered Species Act of 1973)

“... suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...” 16 U.S.C. 460k-1 “... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ...” 16 U.S.C. 460k-2 (Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k- 4), as amended).

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. 742f(a)(4) “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

Chapter 2. Alternatives, Including the Proposed Action

Introduction

This chapter describes the three alternatives for construction of a new fire building. Alternative A (No Action), Alternative B (Proposed Action), and Alternative C (Alternate Site) were considered to address the issues and project goals described in Chapter 1.

All alternatives considered in this EA were developed with the mission of the Refuge System and the purposes of the Refuge as guiding principles. Under the No Action alternative, the Service would continue to provide fire staff office and equipment needs as they have in the recent past. Two of the three alternatives presented in this chapter are “action alternatives” that would involve construction of a new fire building for fire staff office and equipment needs on the Refuge. The Service’s proposed action is Alternative B.

Alternative A: Current Management (No Action)

This alternative would maintain existing fire facilities at the Refuge without development of the fire building. The limited facilities include a fire cache and exercise equipment currently located in an equipment storage building built between 1937 and 1942. This building has no heating or cooling capabilities and has perpetual safety problems including a leaking roof, dry rot, and rodents. Limited office space is located in an office building built in 1939. Both of these buildings are eligible for inclusion in the National Register of Historic Places (NRHP) and are treated as historic buildings. This limits the amount of repairs or modifications that can be made to these buildings to improve working conditions for the fire crew. In addition, these buildings do not meet seismic standards. Fire equipment is currently stored in multiple equipment storage buildings or outside. All of the fire engines are parked outside exposing them to damage from the elements and rodents.

This alternative would not address the purpose and need for the action and would not help fulfill operational goals of the Refuge. These current fire facilities are inadequate for the staff needs and equipment is not able to be stored properly.

Action Alternatives

The following elements were considered during the preparation of the action alternatives:

- Sacramento, Delevan, Colusa, and Sutter National Wildlife Refuges Comprehensive Conservation Plan (USFWS 2009);
- Refuge System mission and purposes and operational goals for the Refuge, as well as project goals and objectives; and
- Laws, regulations, and policies that govern uses on national wildlife refuges.

The two action alternatives include Alternative B (Proposed Action) and Alternative C (Alternate Site).

Elements Common to All Action Alternatives

Both Alternatives B and C would involve construction of a 6,300 square foot fire building on Sacramento Refuge (Figures 2-5) to meet the needs for office space, equipment storage, fire cache, and exercise facilities for the Complex's fire staff. The new building will allow proper storage of fire vehicles and equipment and provide sufficient office space for the fire staff.

Construction of the fire building is proposed for the summer of 2010 or 2011 depending upon funding resources. A concrete pad for the building will be built in late summer/fall of 2009. Approximately 757 cubic yards of fill will be needed to build this pad. An existing ditch will be cleared, deepened, and widened to acquire the amount of fill needed (Figure 6). Vegetation in this overgrown earthen ditch includes non-native eucalyptus and native bulrush, salt grass, cattails, and willows. After cleaning, this ditch will once again be used to for irrigation water to help enhance Refuge habitats.

Both action alternatives are consistent with the Final Comprehensive Conservation Plan (CCP) for the Sacramento, Delevan, Colusa, and Sutter National Wildlife Refuges (USFWS 2009).

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Figure 3. Fire Building East Elevation.

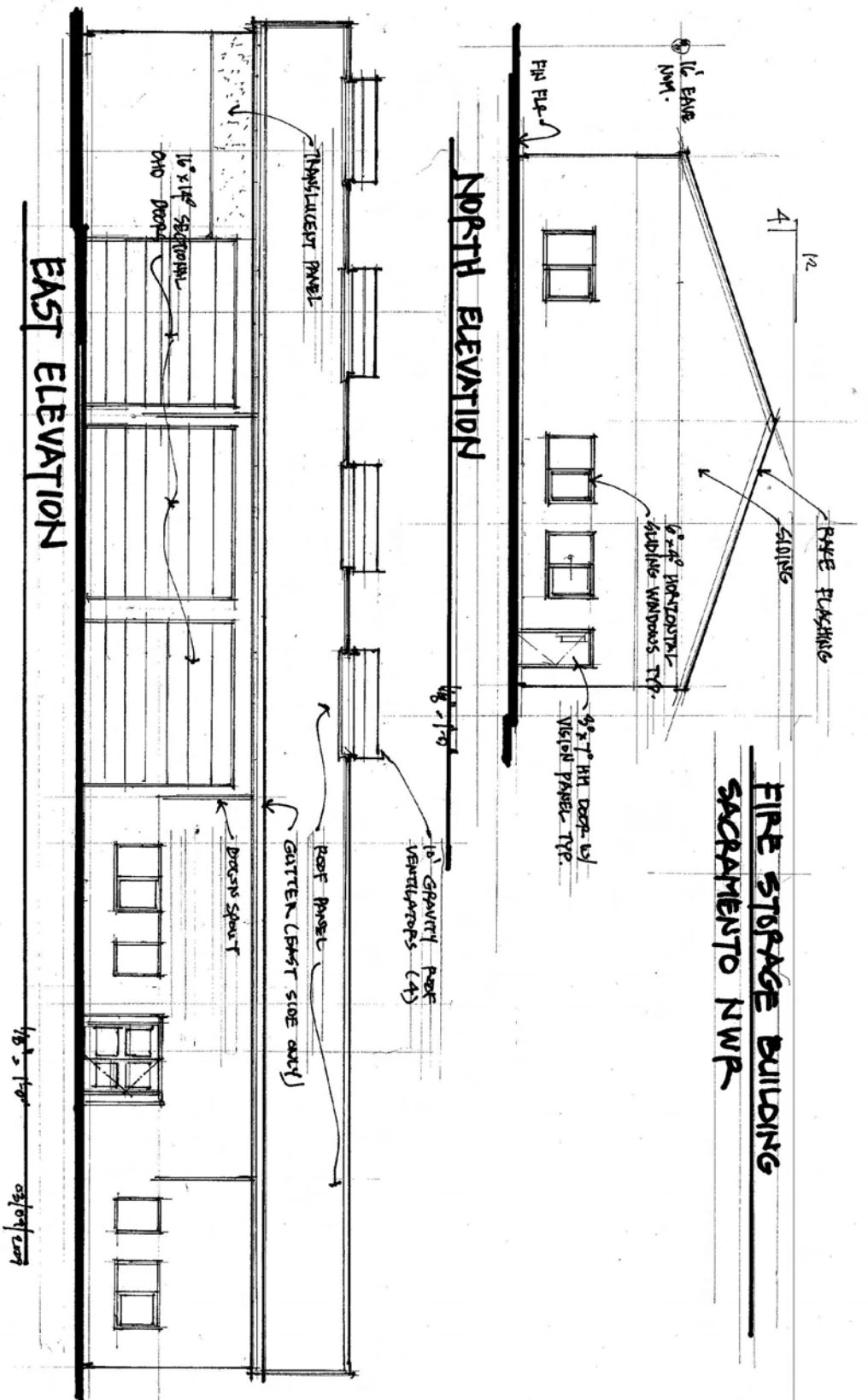


Figure 4. Fire Building Section.

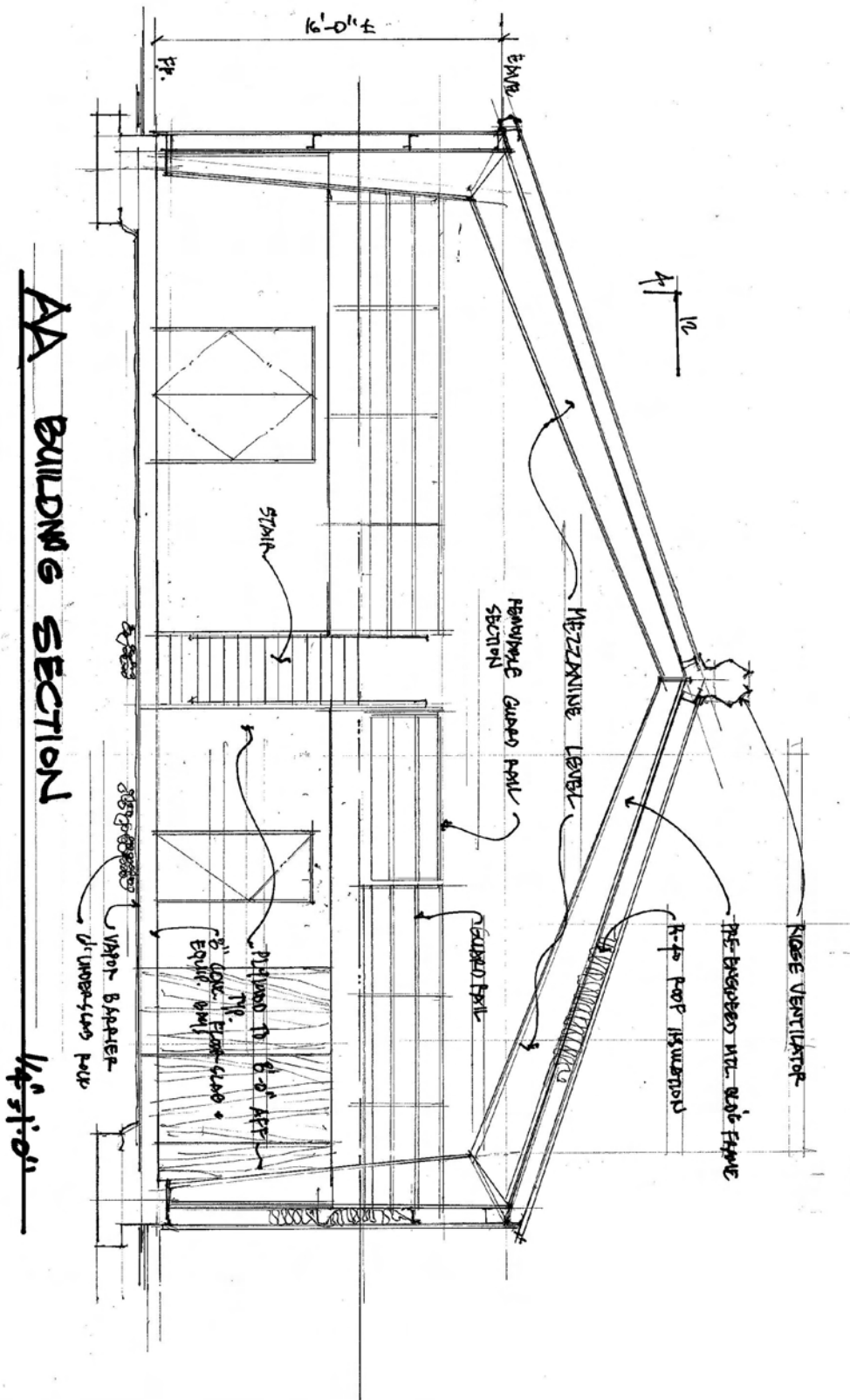
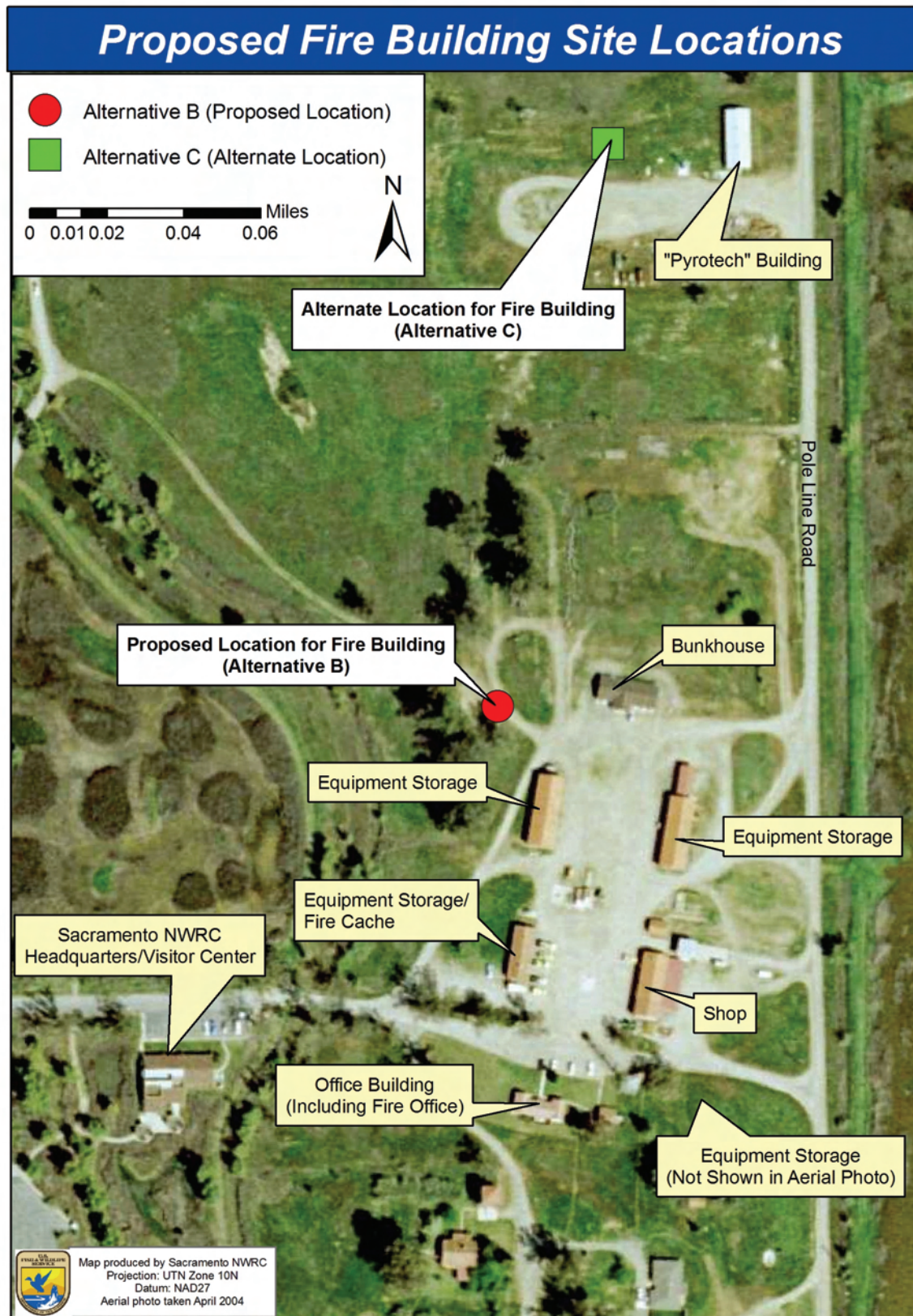


Figure 5. Proposed and Alternative Fire Building Locations.



Alternative B: Proposed Action

With the proposed action, the fire building would be located west of the bunkhouse, in what is a disturbed upland area (Figure 5). Vegetation consists primarily of yellow star thistle and invasive grasses. In addition, several eucalyptus trees will need to be removed prior to the construction. These trees have previously been identified for removal in the Headquarters' Area Eucalyptus Removal Plan for Sacramento National Wildlife Refuge (USFWS 2004).

This location is the preferred site for the fire building. It is the northern most site to allow connection to the Refuge's wastewater treatment facility. Both electricity and water are easily accessible in this location.

Figure 6. Proposed Area to Acquire Fill for the Fire Building's Construction Pad.



Alternative C: Alternate Location

Under Alternative C, the fire building would be located west of the “pyrotech” building (Figure 5). A portion of the pyrotech building is used by Mendocino National Forest for the Organized Crew (OC) program’s fire cache. The site is a disturbed upland area with vegetation consisting primarily of yellow star thistle and invasive grasses.

Under this alternative, a lift pump would need to be installed to allow connection from the fire building to the Refuge’s wastewater treatment facility. Electricity is accessible at this site; however, water is not easily accessible. These items would add to the construction cost for the fire building, making it not the preferred site.

Furthermore, this location can be seen from the Refuge’s auto tour route. The auto tour route receives an average of 57,500 visits annually (USFWS 2009). There will be short-term impacts to refuge visitors during construction of the fire building and long-term impacts to their viewscape from the auto tour route.

Chapter 3. Affected Environment

Introduction

This chapter describes the affected environment or current environmental condition for the Refuge. The natural environment such as geology, hydrology and soils, water quality and contaminants, climate and air quality, vegetation, wildlife and special status species, as well as the social and economic environment and cultural/historic resources are described based on current conditions and available information.

Physical Environment

Geology, Hydrology, and Soils

The Refuge is located in the Colusa Basin. Over 75 percent of this Colusa Basin refuge occurs on basin deposits. Here Refuge soils are located at the higher elevations of the basin (i.e. the basin rim) where they are predominately strongly saline-alkali Willows clay, Willows silty clay, and Riz silty clay loam (Begg 1968). These are wetland soils associated with a high watertable, and subjected to occasional to frequent flooding. A variety of salt-tolerant wetland plants naturally occur in this arid, alkali landscape. These soils are of limited agricultural productivity, supporting rice through the constant application of summer water, which translocates salts deep into the soil profile.

Several natural creeks and sloughs bisect the Colusa Basin including Logan Creek and Hunter Creek on Sacramento Refuge. Prior to land reclamation and flood control, Colusa Basin lands flooded at occasional to frequent intervals. Because of the refuge's Basin Rim location, flood waters quickly receded into the natural troughs and sloughs, these eventually drained into the Sacramento River or large freshwater sinks, such as in the Sutter Basin, where bulrushes (tules) and cattails formed massive impenetrable thickets of vegetation (Holmes et al. 1915). This once extensive marshland habitat supported abundant and diverse native fish and wildlife.

Water Quality and Contaminants

In the Sacramento Valley, due to the lack of a secure water supply, refuges often utilized drain water from surrounding agricultural and urban lands to flood and maintain wetland habitats. Even delivered water from local irrigation districts had often previously been used "upstream," most commonly for growing rice.

The California Department of Fish and Game (CDFG) initiated a selenium verification study in 1985 (White et al. 1987). They concluded that selenium concentrations in water and fish occurred at less than harmful levels in the Sacramento Valley. Fish kills in the Colusa Basin Drain during the early 1980's indicated high concentrations of molinate and the herbicide thiobencarb (associated with rice farming practices) in fish and water samples collected throughout the agricultural drains and in the Sacramento River downstream of drain inflow.

A collaborative study (Dileanis et al. 1992) “concluded there is some degradation of water quality related to agricultural drainage in the region, and elevated concentrations of some chemical constituents were detected in water, sediment, and biological samples. These elevated concentrations were only slightly greater than Service guidelines for possible effects on wildlife.” In addition, exploratory test wells completed in the early 1990s on Sacramento Refuge, documented water contamination with arsenic, cadmium, mercury, and boron exceeding recommended limits.

Air Quality

The Refuge lies within the Sacramento Valley Air Basin (SVAB) and is under the jurisdiction of the Glenn County Air Pollution Control District (GCAPCD). The SVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges provide a substantial physical barrier to locally created pollution, as well as that transported northward on prevailing winds from the Sacramento metropolitan area. The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems.

The state is divided into Air Pollution Control Districts and Air Quality Management Districts. These agencies are county or regional governing authorities that have primary responsibility for controlling air pollution from stationary sources. The GCAPCD establishes policies, regulations, and permit procedures and monitors air quality parameters within Glenn County.

Biological Environment

Vegetation

The Refuge consists mostly of managed wetlands (seasonally flooded and summer wetlands) with much smaller amounts of unmanaged wetlands, vernal pools, alkali meadows, grasslands, riparian forest, and other habitats (Table 1). An in-depth description of these habitats and comprehensive list of plant species can be found the Final CCP (USFWS 2009). The majority of wetlands are seasonally flooded with 10 to 15 percent managed as summer wetlands.

Table 1. Sacramento National Wildlife Refuge Acreage

Total¹	Seasonally Flood Wetlands³	Summer Wetlands⁴	Unmanaged Wetlands²	Vernal Pool/Alkali Meadow²	Grasslands^{2,5}	Riparian Forest^{2,6}	Other^{2,7}
10,819	6,305	781	163	2,941	139	117	373
¹ Official refuge acres. ² Acres calculated with GIS from 2006-07 annual habitat management plans. ³ Includes irrigated and non-irrigated seasonally-flooded wetlands. ⁴ Includes semi-permanent and permanent wetlands. ⁵ Includes annual and perennial grasslands ⁶ Includes mixed riparian forest, cottonwood willow, willow scrub, and valley oak riparian forest. ⁷ Includes roads, facilities, and other miscellaneous areas.							

Wildlife and Special Status Species

A diversity of wildlife exists on the Refuge. A wildlife and plant species list is included in the Final CCP for Sacramento, Delevan, Colusa, and Sutter Refuges (USFWS 2009). Regular wildlife surveys are also conducted on the Refuges (USFWS 1998-2008). Species listed by the Federal or State government as endangered or threatened and other special status species potentially present on Sacramento Refuge and vicinity are listed in Table 2. For a more detail description of these species, please see the Final CCP for Sacramento, Delevan, Colusa, and Sutter Refuges (USFWS 2009).

Table 2. Federal and State listed species occurring or potentially occurring at Sacramento Refuge.

Species		Status		Habitat Type
		State	Federal	
Plants				
Palmate-bracted bird's-beak	<i>Cordylanthus palmatus</i>	CE	FE	vernal pool, alkali meadow
Hairy Orcutt grass	<i>Orcuttia pilosa</i>	CE	FE	vernal pool
Greene's tuctoria	<i>Tuctoria greenei</i>		FE	vernal pool
Hoover's spurge	<i>Chamaesyce hooveri</i>		FT	vernal pool
Invertebrates				
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>		FE	vernal pool
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>		FT	vernal pool
Vernal pool tadpole shrimp	<i>Lepidurus packardi</i>		FE	vernal pool
Amphibians & Reptiles				
Giant garter snake	<i>Thamnophis gigas</i>	CT	FT	wetlands, uplands
Birds				
Bald eagle	<i>Haliaeetus leucecephalus</i>	CE	delisted	wetlands, riparian forest
Swainson's hawk	<i>Buteo swainsoni</i>	CT		riparian forest, grasslands
Greater sandhill crane	<i>Grus canadensis tabida</i>	CT		seasonal wetlands
Willow flycatcher	<i>Empidonax traillii</i>	CE		riparian forest
Status Key: <u>State of California:</u> CE - State-listed, Endangered, CT - State-listed, Threatened <u>Federal:</u> FE - Federal-listed, Endangered, FT - Federal-listed, Threatened, CS – Candidate Species				

Other Special Species

This includes Federal and State of California Species of Special Concern. While not afforded the protection of federally listed and State-listed endangered and threatened species, sensitive species are potential candidates for listing and California Species of Special Concern are considered threatened or rare due to declining habitat, restricted population distribution or size. Usually, information is lacking for upgrading their status.

Federal and California Species of Concern which are present or potentially occur on Sacramento Refuge include western pond turtle (*Clemmys marmorata marmorata*), white-faced ibis (*Plegadis chihi*), long-billed curlew (*Numenius americanus*), double-crested cormorant (*Phalacrocorax auritus*), burrowing owl (*Speotyto cunicularia*), and tricolored blackbird (*Agelaius tricolor*); and the following plants: San Joaquin spearscale (*Atriplex joaquiniana*), heartscale (*A. cordulata*), brittlescale (*A. depressa*), vernal pool saltbush (*A. persistens*), Heckard's dwarf peppergrass (*Lepidium latipes* var. *heckardii*), and Ferris's milk-vetch (*Astragalus tener* var. *ferrisiae*). These species are dependent on various kinds of freshwater wetlands and uplands. The loss and degradation of wetland and alkali meadow habitats is the major factor contributing to population declines of these species.

Social and Economic Environment

1.1. Employment

California has a \$1.4 trillion gross state product, which makes it the largest state economy in the nation and the fifth largest economy in the world (California Department of Transportation 2005). The 2005-2025 County-Level Economic Forecast (California Department of Transportation 2005) reported that the state has 14.9 million wage and salary jobs. In 2004, 139,500 jobs were created, 97 percent of which came from the non-farm sector. The unemployment rate declined to 6.2 percent. The per capita income in California is \$34,220 and the average salary per worker is \$49,690. Employment growth is expected to increase over the next several years.

The unemployment rate is one of the best ways to measure the economic health of a region. The Great Valley Center's report on "Assessing the Region Via Indicators: The Economy" (2005), states that while unemployment in the Central Valley remains substantially higher than the rest of California, the difference has decreased slightly since 1998. From 1994 to 1998, the Central Valley's unemployment rate averaged 11.9 percent, which was 4.8 percentage points higher than the State rate. From 1999 to 2003, the Central Valley unemployment averaged 10 percent, which was 4.2 percentage points higher than the State rate.

Agriculture is a critical part of the economy in Glenn County. In 2004, agriculture was responsible for 20 percent of total employment, and total crop production was valued at over \$327 million (California Department of Transportation 2005). State/local government is the largest employment sector and agriculture is the second (employing 1,520 people) (California Department of Finance 2002). The 2005-2025 County-Level Economic

Forecast (California Department of Transportation 2005) reported that Glenn County had 7,580 wage and salary jobs increasing 5.1 percent (369 jobs) from the previous year. Non-farm employment added 142 jobs, while farm employment added 227 jobs. The unemployment rate, declined to 9.4 percent in 2004. Employment growth is expected to increase over the next several years, as a result of growth in the non-farm sector.

Colusa County is the most productive rice growing county in the nation (New Valley Connexions 2001). Agriculture is the largest employment sector (employing about 2,540 people) and State/local government is second (California Department of Finance 2002). The 2005-2025 County-Level Economic Forecast (California Department of Transportation 2005) reported that Colusa County had 7,480 wage and salary jobs, increasing 1 percent (77 jobs) from the previous year. Non-farm employment added 42 jobs, while farm employment added 35 jobs. The unemployment rate declined to 13.6 percent in 2004. Employment growth is expected to increase over the next several years.

1.2. Local Economy

Agriculture is the dominant economic enterprise in the northern Sacramento Valley and provides nearly 20 percent of the jobs in the Central Valley. The diversity of crops grown in the Sacramento Valley reflects the diversity of soils, climate, cultural and economic factors. Glenn County's major crops include rice, almonds, prunes, and corn. Countywide agricultural production values are \$280.9 million for Glenn (California Department of Finance 2002). Colusa County's include rice, tomatoes, and almonds. Countywide agricultural production values are \$346 million for Colusa (California Department of Finance 2002).

The 2005-2025 County-Level Economic Forecast (California Department of Transportation 2005) reported that Glenn County's per capita income is \$21,210, and the average salary per worker is \$30,780. Colusa County's per capita income is \$27,690, and the average salary per worker is \$31,450.

The report "Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation" (USFWS 2007) detailed the findings from 80 national wildlife refuges, including Sacramento Refuge. The Banking on Nature 2006 study included money spent for food and refreshments, lodging at motels, cabins, lodges or campgrounds, and transportation when it calculated the total economic activity related to refuge recreational use.

According to the report (USFWS 2007), Sacramento Refuge had over 137,430 visits in 2006. Refuge visitors enjoyed a variety of activities, including wildlife viewing, hiking, and migratory bird hunting. Non-residents accounted for about 127,408 or 93 percent of recreation visits and almost all of the visits were for non-consumptive recreations (129,257). Sacramento Refuge generated an estimated \$2.4 million in total economic activity related to refuge recreational use with associated employment of 25 jobs, \$773,500 in employment income and \$391,100 in total tax revenue. Total expenditures were \$1.8

million with non-residents accounting for \$1.7 million or 96 percent of total expenditures. Expenditures on hunting accounted for 57 percent of all expenditures, and non-consumptive activities accounted for 43 percent. Sacramento Refuge generated \$2.78 of recreation-related benefits for every \$1 of budget expenditure during 2006.

The report (USFWS 2007) also states recreational visits to national wildlife refuges generate substantial economic activity. In 2006, 34.8 million people visited refuges in the lower 48 states for recreation. Their spending generated almost \$1.7 billion of sales in regional economies. As this spending flowed through the economy, nearly 27,000 people were employed and \$542.8 million in employment income was generated. In addition, refuge recreational spending generated about \$185.3 million in tax revenue at the local, county, state and Federal level. About 82 percent of total expenditures are generated by non-consumptive activities on refuges. Fishing accounted for 12 percent and hunting 6 percent. Local residents accounted for 13 percent of expenditures while visitors coming from outside the local area account for 87 percent.

1.3. Demographics

In the first 150 years of statehood, California grew from fewer than 100,000 citizens in 1850 to almost 34 million in 2000 (California Department of Finance 2002). Between 1950 and 2000 alone, California's population increased by 200 percent (California Department of Finance 2002). If California continues to add nearly 500,000 persons each year, by 2012, the population could easily exceed 40 million. The 50-million mark will be passed sometime between 2030 and 2040 if current growth rates persist (California Department of Finance 2002).

The Central Valley has been one of the fastest growing areas in California during the last few decades. As of July 1997, the Central Valley had 17 percent of the State's population (Munroe and Jackman 1999).

In 2005, Glenn County's population was 28,197 and is expected to increase to 32,000 residents by 2020 (California Department of Finance 2005). The racial makeup of the county was 71.8 percent white, 29.6 percent Hispanic, 3.4 percent Asian, 2.1 percent Native American, 0.6 percent African American, with the remaining percentage from other races (Percentage total can be greater than 100 percent because Hispanics can be counted in multiple races, U.S. Census Bureau 2000). The estimated median family income was \$32,107.

Colusa County is home to 20,800 residents and is projected to increase to 26,000 residents by 2020 (California Department of Finance 2005). The racial makeup of the county was 64.3 percent white, 46.5 percent Hispanic, 2.3 percent Native American, 1.2 percent Asian, 0.5 percent African American, with the remaining percentage from other races (Percentage total can be greater than 100 percent because Hispanics can be counted in multiple races, U.S. Census Bureau 2000). The estimated median family income was \$35,062.

Cultural and Historic Resources

From the late Pleistocene, more than 10,000 years ago, to present time, humans have occupied northern California and utilized its generous natural resources. Wintun (Nomlaki) occupied both banks of the Sacramento River and the valley and foothills west of the River. The northwest Maidu lived in the valley, east of the River, along Butte and Big Chico Creeks, and had territories extending into the eastern foothills and mountains. The southern-most Yana tribe (Yahi) occupied lands east of the River, north of the Big Chico Creek. The territories of these tribes overlapped seasonally.

American colonization of the Sacramento Valley began during the Mexican Rancho era. John Bidwell, Peter Lassen, and John Parrot were among those awarded a Mexican Land Grant, which included Rancho del Arroyo Chico, Rancho Bosquejo, and Rancho Llano Seco, respectively. Statehood came soon after gold was discovered by James Marshall at Sutter's Mill on the American River. Thousands of fortune seekers immigrated to California and those supplying goods and services to the miners realized economic success. The early ranches and farms provided vital agricultural commodities which helped expand settlement. People and freight were transported by wagon and steamboat. Thirteen ferries were located along the Sacramento River between Red Bluff and Colusa. River travel by steamboat was a practical mode of transportation because river boats could efficiently transport agricultural freight and the valley oak forests and woodlands supplied an abundance of fuel to power these paddle-wheeled steam boats. Ferries, river boat landings, and bridges all played a key roll in the locations of towns and the development of a system of roads. Improved roads and the railroad system eventually replaced river boat travel.

Agriculture was first and foremost the central economic force in the Sacramento Valley. Dry land grain farming was the earliest agricultural practice. Row crops, orchards, rice, and irrigated pasture flourished when abundant water from the Sacramento River and its tributaries irrigated the fertile alluvial soils of the floodplain and basins. Water was distributed to farms through a system of river and stream diversions and water delivery canals. The development of the centrifugal pump in the early 20th century facilitated the expansion of irrigated lands through ground water pumping. Finally, State and Federal water projects for land reclamation, irrigation and urban water supply, and flood control allowed for further agricultural and urban expansion and the industries that followed.

Sacramento Refuge was established in 1937, encompassing the extensive holdings of the Spalding Ranch. A Civilian Conservation Corps (CCC) camp was assigned to the Refuge to transform the wheat and rice fields into a series of ponds for waterfowl. The CCC also began altering the ranch buildings for use as the Refuge Headquarters. For the most part, ranch buildings were torn down and the materials salvaged. The CCC extensively altered the original 1910s ranch house in 1939 to create a "modern" residence (Quarters No. 1) for the refuge manager. The garage was also remodeled from an existing building in 1939. A lookout tower, two service buildings, carpenter shop, water tower, a "caretaker's" residence (Quarters No. 2), and an office were constructed between 1937

and 1942.

In 1980, the Service prepared a determination of eligibility for the buildings at the Sacramento Refuge headquarters for inclusion in the National Register of Historic Places (NRHP) based on its association with the CCC and early development of the Refuge (Criterion A) (Osugi 1980; Speulda and Donovan 2003). The California State Historic Preservation Office concurred with the Service's determination of eligibility, and it was subsequently forwarded to the Keeper of the NRHP for review. Although the Keeper found that the buildings were "undistinguished," he concurred that the Complex as a whole was eligible as a district under Criterion A because of its association with the CCC and noted that "this camp is of exceptional significance in the field of conservation...[it] served as the headquarters for several wildlife conservation areas within the Sacramento River basin and is an important survivor from the early period of the Federal Government's involvement in wildlife conservation."

Although formal nomination of the district to the NRHP was never completed, the buildings remain "eligible" and therefore continue to be treated as historic properties. Of the original buildings and structures evaluated for inclusion in the NRHP, one storage building was destroyed by fire in 1984; three grain bins rusted out and were removed in 1990; the flagpole fell down and was removed in 1998; and one residence and the garage were demolished in 2004 after development of a Memorandum of Agreement in coordination with the State of California, Office of Historic Preservation. The seven remaining buildings and structures include a residence, equipment storage building, office, water tower, observation tower, carpenter shop, and CCC Camp sign.

The Service is legally mandated to inventory, evaluate, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3 of the Service Manual. Field stations initiate the cultural resource review and compliance process by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA determines whether the proposed undertaking has the potential to impact cultural resources, identifies the "area of potential effect," determines the appropriate level of scientific investigation necessary to ensure legal compliance, and assists the field station in initiating consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized Tribes.

Chapter 4. Environmental Consequences

This chapter analyzes the environmental impacts expected to occur from the implementation of the alternatives described in Chapter 2. Impact evaluation has been conducted for each aspect of the environments described in Chapter 3, including physical, biological, and social and economic resources. Direct, indirect, and cumulative impacts are described, where applicable, for each alternative. Alternative A (No Action) is a continuation of management practices that are in place today and serves as a baseline against which Alternatives B and C are compared. Table 3 contains a comparison of the environmental consequences for each of the alternatives.

The National Environmental Policy Act requires mitigation measures be identified and discussed for adverse impacts to habitats, wildlife, or the human environment. None of the activities proposed under Alternative B are expected or intended to produce significant levels of environmental impacts that would require mitigation measures. An agency may support a conclusion of less than significant effects by showing that mitigation measures will significantly compensate for a proposed action's adverse environmental impacts (Friends of Endangered Species v. Jantzen, 760 F.2d 976, 987 (9th Cir. 1985)).

In describing the significance of impacts, the Service defers to NEPA Implementing Regulations at 40 CFR 1508.27.

"Significantly" as used in NEPA requires considerations of both context and intensity:

(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. “

Significance of impacts to the human environment determines whether preparation of an EIS is warranted. Thus, an EA provides a discussion of the magnitude of the impacts within the context of the situation for each impact topic.

Table 3. Summary of Environmental Consequences.

Resource	Alternative A No Action Alternative	Alternative B Proposed Location	Alternative C Alternate Location
Physical Environment			
Hydrology	No impact	Minor local impact	Same as Alternative B
Soils	No impact	Minor local impact	Same as Alternative B
Water Quality and Contaminants	No impact	Minor local impact	Same as Alternative B
Air Quality	No impact	Minor local impact	Same as Alternative B
Noise	No impact	Minor local impact	Same as Alternative B
Biological Environment			
Vegetation	No impact	Minor local impact	Moderate local impact
Wildlife and Special Status Species	No impact	Minor short-term impact	Moderate long-term impact
Social and Economic Environment			
Refuge Visitors	No impact	Minor short-term impact	Minor short and long-term impacts
Employment	No impact	Minor positive impact	Same as Alternative B
Local Economy	No impact	Minor positive impact	Same as Alternative B
Cultural and Historic Resources	No impact	Same as Alternative A	Moderate local impact
Environmental Justice	No minority of low income populations will be disproportionately impacted	Same as Alternative A	Same as Alternative A

Effects on the Physical Environment

Topics addressed under the physical environment section include direct and indirect effects to geology, hydrology, soils, water quality and contaminants, and air quality.

Under Alternative A, no changes are expected to occur on the physical environment.

Geology, Hydrology, Soils, and Water Quality

Under Alternatives B and C, cleaning the ditch to acquire the approximately 757 cubic yards of fill needed for the construction pad (Figure 6) and construction of the fire building would cause some soil disturbance and may temporarily increase erosion and sedimentation rates in the project area. These increases are expected to be minor and localized; therefore, they are not expected to have significant effect upon hydrology, geology, soils, or water quality.

Contaminants

No impacts on contaminants are expected under any of the alternatives.

Air Quality

Under Alternative B and C, minor amounts of short-term increases in pollutant emissions are expected. Short-term increases in dust (PM10) and tailpipe emissions (particulate matter, nitrogen oxides, and reactive gases) would result from the heavy equipment used during construction. The minor emission increases caused by the construction would not be considered significant.

Effects on the Biological Environment

The effects to the Refuge habitats and vegetation as a result of implementing the various alternatives are described below. Potential impacts to these resources are characterized by evaluating direct, indirect, and cumulative effects. Direct impacts would involve the removal of vegetation as a result of ground-disturbing actions, while indirect impacts would involve changes to habitat or vegetation that are incidental to the implementation of an action.

Under Alternative A, no changes are expected to occur on the biological environment.

Vegetation

Under Alternatives B and C, there would be a minor impact on vegetation, as some vegetation would be removed for building construction. Both sites have already been disturbed and consist of primarily invasive species including annual grasses and yellow-star thistle. Eucalyptus trees will also have to be removed under Alternative B. Additional impacts to non-native vegetation and a small amount of native will occur under Alternative C from the installation of additional sewer, water, telephone, and computer lines to the pyrotech area.

In addition, under both alternatives, the ditch identified in Figure 6 will be cleared, deepened, and widened to acquire fill to build the concrete pad for the fire building. Vegetation in this overgrown earthen ditch includes non-native eucalyptus and native bulrush, salt grass, cattails, and willows. The removal of this vegetation will allow irrigation water to flow through the ditch (currently not usable) which will enhance other Refuge wetland habitats containing these plant species.

Wildlife and Special Status Species

The sites described in Alternatives B and C does not contain any special status plant or animal species and provides only marginal habitat for common resident and migratory species. Some wildlife species may be disturbed during construction of the fire building causing short-term minor impacts. Alternative C will have a moderate long-term impact on wildlife than Alternative B due to the increased number of vehicles using Pole Line Road to access the fire building. This increase has the potential to disturb wildlife especially during the winter months when large concentrations of waterfowl may be using the wetlands adjacent to Pole Line Road. This impact is not expected to be significant since the increase in traffic will result in approximately 20 additional refuge vehicles traveling on Pole Line Road daily. The new fire building and its construction will not effect any endangered, threatened and candidate species.

Effects on the Social and Economic Environment

This section discusses the direct and indirect economic effects on the regional economy of implementing the various alternatives. Economic or social changes resulting from an action are considered to produce significant effects if they result in a substantial adverse physical change in the environment (e.g., urban blight).

Under Alternative A, no changes are expected to occur on the social or economic environment.

Refuge Visitors

Under Alternatives B and C, refuge visitors using the auto tour route will have short-term impacts. During ditch cleaning, the short-term wildlife disturbance will reduce the amount of wildlife seen on this portion of the auto tour route. Furthermore, there is the potential that we may have to close this portion of the auto tour route during ditch cleaning. This part of the project will take two weeks, at most, during the late summer/fall. This impact will be minor since the auto tour route has the fewest visitors during the summer.

Under Alternative B, refuge visitors would not be directly affected by construction of the fire building. This location is in a closed area of the refuge where maintenance and other operational activities currently occur and is not visible by the public from the auto tour route.

Under Alternative C, construction of the fire building would alter the viewscape for refuge visitors. Refuge visitors will be able to see the new fire building from the auto tour

route. The auto tour route receives an average of 57,500 visits annually (USFWS 2009). There will be short-term impacts to refuge visitors during construction and long-term impacts to their viewscape from the auto tour route in addition to an increase in operational activities occurring at the site of the new building, which currently has minimal activities during the primary visitation period (October through March).

Employment and Local Economy

Alternatives B and C would have a minor positive impact on the local economy. The estimated cost of the building is \$1.4 million dollars. This may result in temporary jobs and some supplies may be purchased locally. Construction may benefit the overall local economy.

Cultural and Historic Resources

No impacts to cultural or historic resources are expected to occur under Alternative B since these sites have already been disturbed. Furthermore, excavation and construction would not be any deeper than the previous disturbances. Under Alternative C, moderate impacts to cultural resources may occur. A sewer lift line/lift pump will have to be installed because in this alternative the fire building will be too far from of the existing wastewater treatment facility. This construction could impact the CCC camp area.

Under Federal ownership, archaeological and historical resources within a Refuge receive protection under Federal laws mandating the management of cultural resources, including, but not limited to, the Archaeological Resources Protection Act; Archaeological and Historic Preservation Act; Native American Graves Protection and Repatriation Act; and National Historic Preservation Act. Under all alternatives, if any additional cultural resources are discovered on the Refuges, the Service would take all necessary steps to comply with section 106 of the National Historic Preservation Act of 1966, as amended. Neither alternative is likely to impact cultural resources.

Environmental Justice

On February 11, 1994, the President issued Executive Order 12898 (“Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”) requiring that all Federal agencies achieve environmental justice by “identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” Environmental justice is defined as the “fair treatment for peoples of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies.

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. The developing environmental justice strategy of the Service extends this mission by seeking to ensure that all segments of the human population have equal access to America’s fish and wildlife resources, as well as equal access to information that

will enable them to participate meaningfully in activities and policy shaping. The fire building is located on Refuge property and the proposal to construct a new building would not affect any minority of low-income populations.

Cumulative Impacts

Cumulative effects (or impacts) are those effects on the environment resulting from incremental consequences of the Service's proposed actions when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes these actions. Cumulative effects can be the result of individually minor impacts, which can become significant when added over a period of time. Accurately summarizing cumulative effects is difficult in that while one action increases or improves a resource in an area, other unrelated actions may decrease or degrade that resource in another area.

Both action alternatives will benefit the fire program at Sacramento Complex. A new fire building will provide proper storage facilities and sufficient office space for the fire crew. Alternatives B and C would provide greater benefit than Alternative A due to the increased facilities. Both action alternatives would also have short-term benefits for the local economy.

Construction of the fire building will not impact undisturbed native habitats. The loss of a small amount of non-native habitat is offset by the ongoing restoration of native habitats on the Refuge.

None of the alternatives is expected to have adverse cumulative impacts on the economy. Adherence to the policies and regulations pertaining to the protection of cultural resources would avoid any cumulative effects as a result of implementing any of the action alternatives.

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